

3.8 Computed Tomography (CT)

I. BACKGROUND AND GOALS

1. The Multi-Ethnic Study of Atherosclerosis (MESA) is studying risk factors and measures of cardiovascular disease that relate to progression of subclinical to clinical disease. An integral part of this study is the measurement of coronary artery calcium using either electron beam computed tomography (EBCT) or helical computed tomography (HCT). Coronary calcium will be assessed in relation to the risk of future cardiac events, and from repeated scans in selected individuals, the progression of coronary calcium will be related to baseline risk factors and risk of future events.
2. Of the participants that have been recruited in the MESA, a randomly selected sample of about half of participants will receive repeated scans for coronary calcium during Exam 2.
3. Goals
 - 3.1 To examine the relation of baseline measures of coronary calcium quantity (score and volume measures) to future risk of cardiac events
 - 3.2 To examine the relation of baseline measures of coronary calcium to other risk factors and measures of subclinical disease (e.g., MRI and ultrasound measures).
 - 3.3 To examine the relation of progression of coronary calcium to the risk of future cardiac events, as well as to risk factors at baseline and progression of risk factors.
 - 3.4 To examine the above goals by ethnic and gender strata, when possible.

II. QUALIFICATIONS OF PERSONNEL

1. Field Center personnel will be responsible only for escorting participants to and from the CT scanning site and ensuring that the 'CT Completion Form' is completed by the scanning technologist.
2. Each Field Center has a designated radiologist or cardiologist who is responsible for the performance of the CT examinations at his/her MESA Field Center. This physician's role is similar to that in Exam 1.
3. Field Center technologists should have appropriate knowledge of cross-sectional anatomy, physiology, and pathology related to the heart.
4. Each technologist involved in the study should also have a complete understanding of this protocol, be experienced at providing breath-holding instruction, ECG gating, operation of the EBCT or HCT equipment.
5. To ensure quality control, each Field Center should have designated CT technicians who will perform the MESA examinations. Technologists must be certified as RTs in their state. Technologist certification needs to be fulfilled as in previous exams.

III. PARTICIPANT SCHEDULING

1. Procedure is unchanged from Baseline Exam. Refer to the "Exam 1 MOP" for further details.

2. A Field Center interviewer/scheduler will be responsible for explaining and obtaining consent for the CT examination. Participants will be scheduled for a certain date and time, and transportation arrangements, if necessary, will be arranged by the Field Center interviewer/scheduler. A confirmation appointment letter will be sent, providing the time, date, and directions to the scanning center, and describing the procedure.
3. The scanning procedure will require approximately 20 minutes of the subject's time.

IV. COMPLETING THE CT EXAMINATION COMPLETION FORM

1. The CT Completion form must be filled out by either the CT technologist or the attending Field Center staff member. If the Field Center staff member completes the form, he/she will need to get information from the CT technologist before leaving the scan area. The form will be taken back to the clinic and scanned into the computer along with the other forms. The information on the form will be forwarded to the CT reading center for image tracking purposes.

Only a subset of participants will be selected to undergo the CT scan in Exam 4. Of those selected, some will receive scans of the chest and aorta, some will have only the aortic scan, and a few may have only a chest CT. The printed CT Examination Completion Form should indicate which scans the participant will have. In addition, other clinic paperwork or forms will provide information regarding selection for CT and the type of scan to be performed. The Participant Data Sheet, the Sixth Follow-up Contact Log, and the Exam 4 Clinic Reception Form will indicate whether or not the participant is selected for CT and which scans should be performed. Confirm that the printed CT Examination Completion Form is consistent with this information.

Specific instructions:

Note: Record current *clinic weight*—not self-reported weight—in the weight field and enter clinic weight into the CT machine prior to performing the scan.

1. ***For women 45–55: Results of pregnancy test:***
Select “positive,” “negative,” or “not done.”
If “not done,” provide reason.
2. ***Has this participant undergone angioplasty any time in the past?***
Select “yes,” “no,” or “don’t know.”
3. ***Has this participant undergone coronary bypass any time in the past?***
Select “yes,” “no,” or “don’t know.”

4. ***Results of CT scan:***

Select “complete,” “incomplete,” or “not done.” Select “complete,” if the scan was complete or partially complete and a file containing the scan data will be sent to the CT Reading Center. Select “incomplete,” if the scan was only partially completed because of a technical or participant problem. Select “not done,” if the scan was never started because of a technical or participant problem.

If “complete,” proceed to question 5.

If “incomplete” or “not done,” provide reason:

Select “equipment malfunction,” “participant physically unable to continue,” or “other.”

If “other,” provide reason..

5. ***Results of Aortic scan:***

Select “complete,” “incomplete,” or “not done.” Select “complete,” if the scan was complete or partially complete and a file containing the scan data will be sent to the CT Reading Center. Select “incomplete,” if the scan was only partially completed because of a technical or participant problem. Select “not done,” if the scan was never started because of a technical or participant problem.

If “complete,” proceed to question 6.

If “incomplete” or “not done,” provide reason:

Select “equipment malfunction,” “participant physically unable to continue,” “participant refused,” or “other.”

If “other,” provide reason

6. ***Comment on unusual findings:***

Note any comment you would like the Reading Center to consider when evaluating this CT scan.